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IS 486 (2012): Brushes, Sash Tool, for Paints and Varnishes
- Specification [CHD 24: Brushware]



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“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

SPECIFICATION FOR BRUSHES, SASH TOOL, FOR PAINTS AND VARNISHES

(Third Revision)

UDC 687.978 : 667.661.22



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INDIAN STANDARDS INSTITUTION
MAKAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

AMENDMENT NO. 1 SEPTEMBER 2004
TO
IS 486 : 1983 SPECIFICATION FOR BRUSHES,
SASH TOOL, FOR PAINTS AND VARNISHES

(Third Revision)

(Page 4, clause 2.0) — Substitute the following for the existing:

'2.0 For the purpose of this standard, the definitions given in IS 5060 : 1969* and IS 707 : 1987† shall apply.'

(Page 4, footnote marked '†') — Substitute the following for the existing footnote:

†Glossary of terms applicable to timber technology and utilization (*third revision*).'

(Page 4, clause 2.1) — Delete.

(Page 4, clause 4.1.1.1, second sentence) — Delete.

(Page 8, clause 4.4.2) — Delete.

(Page 10, clause 6.1) — Substitute 'Lindane 6.5% DP (see IS 14834 : 2000*) or methyl parathion 2% DP (see IS 8960 : 1978§) for 'DDT dusting powder (see IS : 564 - 1975*)' .

(Page 10, footnote marked '*') — Substitute the following for the existing footnote:

*Lindane dusting powder — Specification.'

(Page 10, footnotes) — Insert the following footnote at the end:

§Specification for methyl parathion dusting powders.'

(Page 10, clause 8, Title) — Substitute '**SAMPLING**' for '**TENDER SAMPLES AND SAMPLING**'.

(Page 10, clause 8.1) — Delete.

(Page 10, clause 8.1.1) — Delete and renumber the subsequent clause.

Indian Standard

SPECIFICATION FOR BRUSHES, SASH TOOL, FOR PAINTS AND VARNISHES

(Third Revision)

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(Continued on page 2)

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Indian Standard

SPECIFICATION FOR BRUSHES, SASH TOOL, FOR PAINTS AND VARNISHES

(Third Revision)

0. FOREWORD

0.1 This Indian Standard (Third Revision) was adopted by the Indian Standards Institution on 30 March 1983, after the draft finalized by the Brushware Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was first issued in 1954 and subsequently revised in 1963 and 1973. In the earlier revisions, moisture content of the timber used for manufacturing handles for brushes had been increased to 15 percent, use of tinplate had been prescribed instead of nickel-plated brass for the manufacture of ferrules and excluded the use of brass pins.

0.2.1 In this third revision the measurement of the handle of sash tool brush has been corrected in accordance with the long standing trade practice to make the brush-head separately with the wedge in its proper place and then to fix the handle with the brush-head to complete the sash tool brush. The representation of length of handle outside the ferrule (*D*) has been modified accordingly in Fig. 1.

0.2.2 This type of brushes are generally used for painting window sashes and other narrow strips.

0.3 This standard contain clauses **4.1.6.1**, **5.1** and **7.2** which call for agreement between the indenter or inspection authority and the supplier.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for sash tool brushes for paints and varnishes made from bristles and set in a suitable cement.

2. TERMINOLOGY

2.0 For the purpose of this standard, the definitions given in IS : 5060-1969*, IS : 707-1976† and the following shall apply.

2.1 Approved Tender Sample — The sample accepted by the indenter or inspection authority as basis for supply. When a sample is tested and approved by the purchaser or an inspection authority, the results of such tests as will permit the supplier to meet the limits imposed by the specification for deliveries shall be made available to the supplier.

3. SIZES

3.1 The sash tool brushes shall be of six sizes (*see* Table 1) with the following denominations:

- a) No. 2,
- b) No. 4,
- c) No. 6,
- d) No. 8,
- e) No. 10, and
- f) No. 12.

4. REQUIREMENTS

4.1 Materials — The brushes shall be manufactured from the following materials.

4.1.1 Bristles — The bristles used shall be of animal hair (hog pig or boar) and shall satisfy the following description.

4.1.1.1 Description — Selected, properly straightened, natural black and soft/semi-stiff bristles only (conforming to IS : 1844-1975‡) shall be used. As regards colour, lustre and stiffness, the bristles shall match those used in the approved tender sample.

*Glossary of terms used in brushware industry.

†Glossary of terms applicable to timber technology and utilization (*second revision*),

‡Specification for bristles (*first revision*).

4.1.2 Timber — Any of the timber species listed in Appendix A shall be used.

4.1.2.1 The timber shall be reasonably straight-grained and well seasoned to a moisture content not exceeding 15 percent, when tested by the approved moisture meter or in case of dispute by oven-dry method (see Appendix B).

4.1.2.2 The timber shall be free from brashness, any kind of biological or non-biological deterioration, insect attack, centre-heart (pith), knots (except live pin knots), cracks, warp and any other defects which may reduce the life of the brush or affect its utility.

4.1.3 Ferrule — The ferrule shall be either seamless or hook-jointed. The ferrule shall be of either 0.40 to 0.50 mm thick tinplate or 0.60 to 0.80 mm thick aluminium sheet.

4.1.4 Wedge — A suitable non-metallic wedge of the shape as shown in Fig. 1 shall be used.

4.1.5 Pins — The securing pins shall be flat or round-head steel pins, 6 mm in length and 1.0 to 1.4 mm in diameter.

4.1.6 Cement — Any suitable cement capable of satisfying the tests specified under **4.5.1**, **4.5.2** and **4.5.3** shall be used.

4.1.6.1 Vulcanized rubber setting may be used subject to agreement between the indenter and the supplier.

4.1.7 Varnish or Lacquer — It may be coloured or clear.

4.2 Dimensions and Tolerances

4.2.1 Dimensions — The brushes shall conform to the dimensions given in Table 1.

4.2.2 Tolerances — The tolerances on the linear dimensions shall be as follows:

<i>Nominal Dimension</i>	<i>Tolerance</i>
mm	mm
Up to 15	±1.0
Over 15 but below 40	±2.0
40 and above	±3.0

4.2.2.1 The above tolerances shall not apply to bristles for which minimum lengths have been prescribed in Table 1.

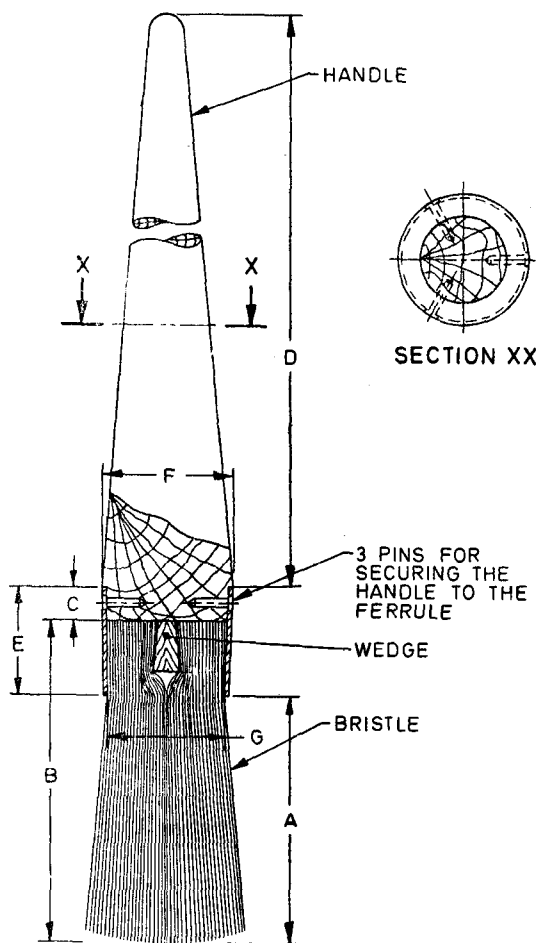


FIG. 1 SHAPE AND DESIGN OF BRUSHES, SASH TOOL

4.2.2.2 A tolerance of ± 1.0 mm shall be allowed on the diameter of the ferrule.

4.2.3 The solid dressing of the bristles used shall be in accordance with Table 1 of IS : 1844-1975*.

*Specification for bristles (first revision).

TABLE 1 REQUIREMENTS OF BRUSHES, SASH TOOL, FOR PAINTS AND VARNISHES

(*Clauses 3.1, 4.2.1 and 4.2.2.1*)

SL No.	SIZE DENOMI- NATION	BRISTLES		HANDLE		FERRULE			MASS OF BRISTLES PER FINISHED BRUSH
		Protrusion, <i>Min</i> <i>A</i>	Overall Length, <i>Min</i> <i>B</i>	Length of the Recessed Portion of the Handle to take Ferrule <i>D</i> <i>C</i>	Length of Handle out of the Ferrule	Length <i>E</i>	Diameter		
							<i>F</i>	<i>G</i>	
(1)	(2)	(3) mm	(4) mm	(5) mm	(6) mm	(7) mm	(8) mm	(9) mm	(10) g
i)	No. 2	52	64	10	135	25	22	19	8
ii)	No. 4	57	70	10	150	28	25	22	15
iii)	No. 6	62	76	10	155	28	28	25	22
iv)	No. 8	72	83	10	170	28	32	28	32
v)	No. 10	77	89	10	175	32	35	32	42
vi)	No. 12	82	95	10	180	32	38	35	52

NOTE — For legends *A* to *G*, see Fig. 1.

4.3 Manufacture — The brushes shall generally conform to the shape and design as shown in Fig. 1.

4.3.1 The handle shall be shaped to suit the ferrule.

4.3.2 The brushes shall be introduced into the ferrule from the larger end with the peg in proper position, secured into the ferrule with the cement or rubber-setting solution, and properly set or vulcanized. In no case the hard mass of setting compound or wedge shall appear out of the ferrule.

4.3.3 The handle shall be tight-fit into the ferrule and secured by means of three pins placed equidistant on the circumference of the ferrule.

4.4 Workmanship and Finish — The handle shall be finished smooth all over and shall be properly varnished or lacquered.

4.4.1 The ferrule shall be free from sharp edges.

4.4.2 In general workmanship and finish, the brushes shall match the approved tender sample.

4.5 Test Requirements

4.5.1 Pull Test — When a small bunch of bristles is subjected to a straight pull with thumb and finger grip, the same shall not come out.

4.5.2 Benzene Alcohol Test — Immerse the bristle portion of the brush for 48 hours in a mixture of benzene (*see* IS : 534-1974*) and absolute alcohol (*see* IS : 321-1964†), (1:1 by volume) maintained at room temperature in such a way that at least half of the ferrule is above the level of solvent mixture and the bristles do not touch the bottom of the container. On completion of this test, the bristles shall show no sign of loosening when used as a brush without paint on a plane surface.

4.5.3 Oven Test

4.5.3.1 For non-rubber set brushes — The brush, without handle, when suspended in an oven with the protruding bristle end upward and subjected to a temperature of $60 \pm 2^{\circ}\text{C}$ for four hours, shall show no appreciable creeping of the cement. Further after cooling the brush in air for 30 minutes, the anchorage of bristles shall not become loose inside the ferrule and the cement shall not become loose inside the ferrule and the cement shall satisfy the pull test prescribed in 4.5.1.

4.5.3.2 For rubber set brushes — The brush, without handle, when suspended in an oven with the protruding bristle end upward and subjected to a temperature of $132 \pm 2^{\circ}\text{C}$ for 2 hours, shall show no appreciable

*Specification for benzene (*second revision*).

†Specification for absolute alcohol (*revised*).

creeping of the cement. Further, after cooling the brush in air for 30 minutes, the anchorage of bristles shall not become loose inside the ferrule and the cement shall not become loose inside the ferrule and the cement shall satisfy the pull test prescribed in 4.5.1.

4.5.4 Detection of dyed bristle — The following two methods shall be utilized for detection of dyed bristles when tested as prescribed in Appendix C of IS : 1844-1975*.

Method A — by microscopic examination, and

Method B — by sand paper test.

4.5.4.1 Method A shall be referee method and Method B for routine testing.

4.5.5 Mass of Bristles per Finished Brush — The mass of bristles as determined by the method prescribed in Appendix C, shall be as specified in col 10 of Table 1. A tolerance of ± 5 percent shall be allowed in the mass of the bristles provided the average mass of the bristles per brush, in any lot is not below than that specified. The average mass of the bristles per brush in a lot shall be assessed by taking the average mass of the bristles of three brushes in lots not exceeding 300 brushes and six brushes in lot exceeding 300 brushes.

4.5.6 Processing of Bristles — The processing of the bristles shall be considered as satisfactory, if not less than 85 percent of the bristles by mass are of categories (a) and (b) as prescribed in **D-2.2** and out of these 60 percent belong to category (a).

5. MARKING

5.1 Unless otherwise agreed to between the indenter or inspection authority and the supplier, each brush shall be legibly and indelibly marked or stamped with the following:

- a) Manufacturer's name and trade-mark, if any;
- b) Year of manufacture;
- c) Warranty of the bristles; and
- d) Size denomination of brush.

5.1.1 The rubber set brushes shall, in addition to the marking specified under **5.1**, be marked on the ferrule or handle with the words 'RUBBER SET'.

*Specification for bristles (*first revision*).

5.1.2 The brushes may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. PRESERVATION

6.1 The bristles of the brushes shall be liberally dusted, before packing, with a mixture of 5 parts (by mass) of DDT dusting powder (*see* IS: 564-1975*) and 95 percent (by mass) of French chalk (*see* IS : 380-1978†). Alternatively, naphthalene balls (*see* IS : 559-1974‡) shall be used in the packing box for the brushes.

7. PACKING

7.1 The bristle portion of the brush along with the ferrule shall be nearly covered with polyethylene or cellulose film and secured by a rubber band.

7.2 The brushes shall be packed as agreed to between the indenter or inspection authority and the supplier.

8. TENDER SAMPLES AND SAMPLING

8.1 Tender Samples — The supplier shall submit four identical brushes of each denomination for approval.

8.1.1 The indenter or inspection authority shall retain one of the four approved tender samples against each item till the completion of the order.

8.2 Sampling — The method of drawing representative samples of the brushes and the criteria for conformity shall be as prescribed in Appendix E.

*Specification for DDT dusting powders (*second revision*).

†Specification for French chalk, technical (*second revision*).

‡Specification for naphthalene (*second revision*).

APPENDIX A

(Clause 4.1.2)

SPECIES OF TIMBER FOR THE MANUFACTURE OF HANDLES FOR BRUSHES, SASH TOOL, FOR PAINTS AND VARNISHES

STANDARD	TRADE NAME	BOTANICAL NAME
Roman	Devanagari	
aini	ऐनी	<i>Artocarpus hirsuta</i> Lamk, fam. Moraceae
banati	बनाती	<i>Lophopetalum wightianum</i> Arn., fam. Celastraceae
bijasal	बीजसाल	<i>Pterocarpus marsupium</i> Roxb. fam. Leguminosae
champak	चम्पक	<i>Michelia champaca</i> Linn., fam. Magnoliaceae
chikrassi	चिकरासी	<i>Chukrasia tabularis</i> A. Juss, fam. Meliaceae
dhaman	धामन	<i>Grewia tiliifolia</i> Vahl, fam. Verbenaceae
gamari (gumhar)	गमारी (गुम्हार)	<i>Gmelina arborea</i> Roxb. fam. Tiliaceae
haldu	हल्दु	<i>Adina cordifolia</i> Hook. f. fam. Rubiaceae
kain	कैम	<i>Mitragyna parvifolia</i> (Roxb.) Korth, syn. <i>Stephegyne parvifolia</i> Korth., fam. Rubiaceae
kanju	कांजू	<i>Holoptelea integrifolia</i> (Roxb.) Planch., fam. Ulmaceae
kathal	कटहल	<i>Artocarpus heterophyllus</i> Lamk., syn. <i>A. integrifolius</i> , Linn, f, fam. Moraceae
kuthan	कूथन	<i>Hymenodic tyon excelsum</i> Wall., fam. Rubiaceae
lambapatti	लम्बापत्ती	<i>Planchonella longepetiolatum</i> H. J. Lam. syn. <i>Sideroxylon longe petiolatum</i> King and Prain, fam. Sapotaceae
nim-chameli	नीम-चमेली	<i>Millingtonia hortensis</i> Linn. fam. Bignoniaceae
kodapalai choupaini (piney)	कोडपलई चौपैनी (पिने)	<i>Kingiodendron pinnatum</i> Roxb., syn. <i>Hardwickia pinnate</i> Roxb., fam. Leguminosae
toon	तून	<i>Toona cilata</i> Roem., syn. <i>Cedrela toona</i> Roxb. fam. Meliaceae

APPENDIX B

(Clause 4.1.2.1)

DETERMINATION OF MOISTURE CONTENT FOR TIMBER USED IN BRUSHES, SASH TOOL, FOR PAINTS AND VARNISHES, FLAT

B-1. TEST SPECIMEN

B-1.1 The entire block used in brushes may form the test specimen for determination of moisture content or a coupon cut from the test specimen may, as well, be used for moisture content determination. When for any reason additional determination of moisture content is required, separate samples shall be prepared from the sample material as is used in preparing the test specimens. Smaller specimens may be used when deemed necessary. The test shall be carried out immediately after cutting the specimen.

B-2. PROCEDURE

B-2.1 Weigh accurately each test specimen. This specimen shall then be dried in a ventilated oven at a temperature of $105 \pm 2^{\circ}\text{C}$ until the mass becomes constant between two successive weighings made at an interval of not less than one hour.

B-3. CALCULATION

B-3.1 The moisture content, expressed as a percentage of the oven-dry mass, is given by the following formula:

$$\text{Moisture content} = \frac{M_1 - M}{M} \times 100$$

where

M_1 = initial mass in g of the test specimen, and

M = oven-dry mass in g of the test specimen.

APPENDIX C

(Clause 4.5.5)

METHOD FOR DETERMINATION OF MASS OF BRISTLES

C-0. GENERAL

C-0.1 For determining the mass of bristles in a brush, the bristles are detached by gentle hammering as described under **C-1.1** or, if the bristles are set in vulcanized rubber, by soaking in a solvent and detaching the bristles from the cement as described under **C-1.2**.

C-1. PROCEDURE

C-1.1 For Cement Other than Vulcanized Rubber — Remove all connecting pins as well as those securing the handle. Cut the ferrule right through its length on any one of the sides by means of a chisel. Open the ferrule and take out the bristles. Hammer the root ends of the bristles gently with a raw hide mallet to reduce the cement to powder and shake the bristles. Repeat this process till all traces of cement are removed and then weigh the bristles.

C-1.2 For Vulcanized Rubber Setting — Open the ferrule as described in **C-1.1** and take out the bristles. Soak the setting of an appropriate solvent until it is sufficiently friable to be broken down. This should normally take 12 to 18 hours. Remove the bristles from the solvent mixture and gently knead between the fingers so as to separate the bristles from the block into which they are mounted, but taking care that no undue force is used which may break the bristles. Repeat this process until the bristles are free from their vulcanized rubber setting. Drying in an oven at $100 \pm 2^\circ\text{C}$. Cool and weigh under prevalent atmospheric conditions.

NOTE — Trichloroethylene or dichloromethane is suitable for rubber or pitch settings and acetone for synthetic resin settings.

APPENDIX D

(Clause 4.5.6)

METHOD FOR DETERMINATION OF PROCESSING OF BRISTLES

D-0. GENERAL

D-0.1 The object of this test is to determine whether the processing of bristles for the elimination of their natural tendency to curve has been adequate or not.

D-1. TEST SAMPLE

D-1.1 A bunch of bristles freed from cement, as prescribed under Appendix C and consisting of at least 50 percent of the total mags of the bristles of the brush shall constitute the test sample.

D-2. PROCEDURE

D-2.1 Tie the test sample loosely with thread or linen tape at one end and suspend into the water maintained at $70 \pm 2^\circ\text{C}$ for 10 minutes. Remove the bristles from the water and shake to remove as much water as possible. Untie the knot and spread out all the bristles on a large sheet of blotting paper in a warm place. Allow to dry at room temperature for 48 hours.

D-2.2 The bristles shall then be measured and categorized as below:

- a) Bristles which are straight,
- b) Bristles which have a curvature whose radius is 230 mm or more (see Fig. 2), and
- c) The remainder.

D-2.3 Criteria for Conformity — For deciding the conformity of processing of the bristles, the bristles selected according to **D-1.1** shall satisfy the requirements prescribed in **4.5.6**.

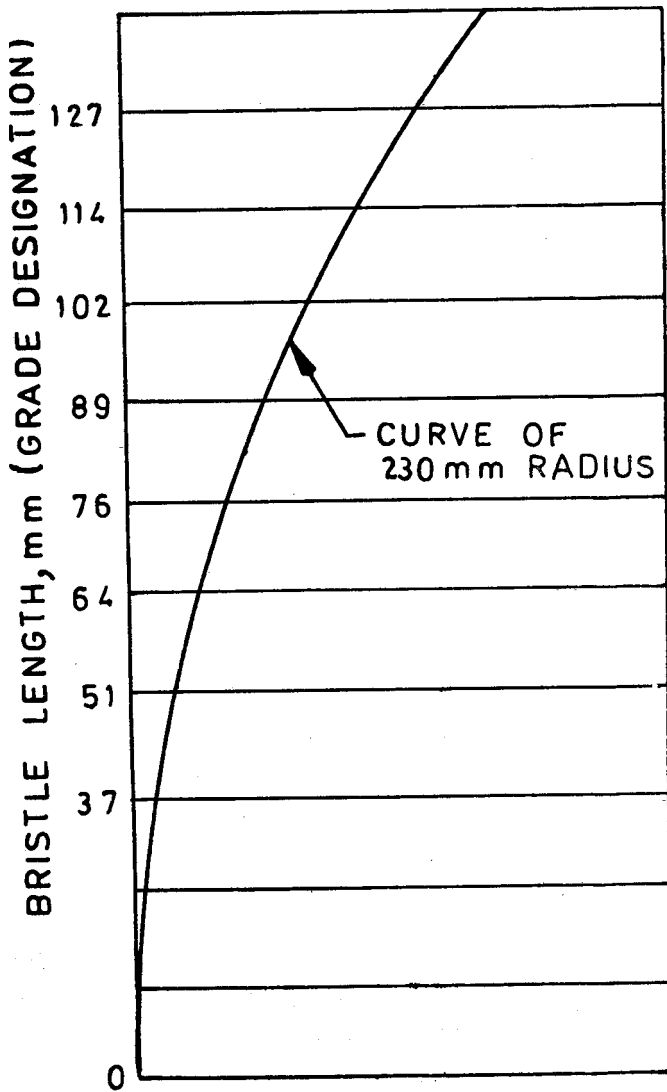


FIG. 2 DETERMINATION OF CURVATURE OF BRISTLES

APPENDIX E

(Clause 8.2)

SAMPLING OF BRUSHES AND CRITERIA FOR CONFORMITY

E-1. METHOD OF SAMPLING

E-1.1 Lot— In any consignment, all the brushes of the same size and quality shall be divided into groups of 500 brushes or less and each such group shall constitute a lot. Care shall be taken to ensure that the brushes included in a lot do not differ in construction, as far as possible.

E-1.1.1 The conformity of the brushes in a lot to the requirements of this specification shall be ascertained for each lot separately. The number of brushes to be selected for this purpose shall be in accordance with Table 2.

TABLE 2 SCALE OF SAMPLING

No. OF BRUSHES IN THE LOT	No. OF BRUSHES TO BE SELECTED
N	n
(1)	(2)
Up to 50	4
51 to 100	5
101 to 150	6
151 to 300	7
301 to 500	8

E-1.1.2 The brushes shall be selected at random. To ensure randomness of selection, one of the following procedures is recommended for use:

- If all the brushes in a lot are packed in one box, then starting from any brush, count them in any suitable order as 1, 2, up to r and so on, where r is the integral part of N/n (N and n being the lot size and the sample size respectively). Every r th brush thus counted shall be withdrawn to constitute the sample.
- If the brushes in a lot are packed in more than one box, approximately equal number of brushes shall be picked up at random from as many boxes as possible so as to obtain the required number of brushes as specified in Table 2.

E-2. CRITERIA FOR CONFORMITY

E-2.1 For deciding the conformity of the lot to the requirements of this specification, all the brushes selected according to **E-1.1.2** shall satisfy the relevant requirements given in 4.